

## A MEDICINE FOR TREATING ACNE

### BACKGROUND OF THE INVENTION

#### FIELD OF THE INVENTION

5 This invention relates to a medicine and more particularly to a gel/salve type of medicine that is to be applied on the surface of skin for the purpose of treating acne combined with an oral dose of Vitamin A.

#### DESCRIPTION OF THE RELATED ART

10 Acne is a pleomorphic skin disease, commonly referred to as acne vulgaris, characterized by blackheads, whiteheads, papules, pustules and various size nodules and scars. The disease involves the hair follicle characterized by enlargement and infection of the sebaceous glands and ducts. A sebaceous gland is a gland which draws into the hair follicle and produces and  
15 liberates sebum, which is a mixture composed of fat, cellular debris and keratin. A normal hair follicle is lined by protective layers of cells, which is known as the stratum corneum.

When the sebaceous gland is located in association with a hair follicle, it forms a thickened out-pushing from the side of the

developing follicle near the epidermis. Central cells in these sebaceous glands form oil droplets within the cytoplasm. These cells disintegrate to liberate the sebaceous oil known as sebum. The central passage through which a hair shaft passes is to be open (unobstructed) to allow the sebum secreted by the sebaceous glands to easily reach the surface of the skin.

Sebum is complex liquid liberated by the breakdown of the sebaceous cells and is intimately associated with the development of acne. A perifolliculitis results following rupture of the follicular contents (sebum) into the dermis. This occurs secondary to obstruction of the opening of the sebaceous follicle by a whitehead or a blackhead. The inflammatory response eventually heals generally with a scar formation.

Acne is an extremely common occurrence in conjunction with young adults. It is when the hair follicle becomes plugged and the sebum is not able to be released that bacteria causes an inflammation to occur which frequently results in a reddish pimple-like appearance on the surface of the skin. Plugging of the hair follicle by excessive layers of stratum corneum cells is the underlying abnormality leading to the development of acne lesions. The most common treatment is to use benzoyl peroxide to treat acne. The purpose of the benzoyl peroxide is to kill the bacteria that accumulates in the clogged follicles. It has been found when using of the benzoyl peroxide that the approximate percent decrease in plugged follicles ranges between 15 and 22 percent in most cases. Therefore, benzoyl peroxide is not

effective in unplugging the follicles. Its main efficacy in the treatment of acne is to decrease inflammatory pimples by killing bacteria.

5 The stratum corneum consists of multiple (ten to twenty or more) layers of flattened skin scales (stratum corneum cells) cemented together by a "glue" known as desmoglein. Within the present invention, it has been found that the desmoglein can be removed by activating an enzyme which results in loosening of the stratum corneum scales causing unplugging of the follicles  
10 resulting in eventual removal of the obstruction against the flow of the sebum to the skin surface. With the unplugging of the follicles, acne formed lesions dissipate.

#### SUMMARY OF THE INVENTION

15 A first basic embodiment of this invention consists of a composition which is formed of a combination of an anti-inflammatory agent and a second agent that stimulates the production of an enzyme which digests the cementing substance contained within epidermis skin.

20 A further embodiment of the present invention is where the first basic embodiment is modified by the anti-inflammatory agent being selected of the group consisting of curcumin, polyphenols and corticosteriods.

A further embodiment of the present invention is where

the first basic embodiment is modified by the second agent as being selected from the group consisting citric acid, ascorbic acid, azelaic acid, glycolic acid, acetic acid and hydroxy acids.

5 A further embodiment of the present invention is where the first basic embodiment is modified by the amount of anti-inflammatory agent is within the range of .001 percent to 10 percent by volume.

10 A further embodiment of the present invention is where the first basic embodiment is modified by adding a sufficient amount of the second agent to obtain a pH as between 4.5 to 5.5.

15 A second basic embodiment of the present invention is directed to composition for treating acne which includes the following ingredients: water-60 to 85 percent by volume, alcohol-5 to 30 percent by volume, cellulose-.01 to 10 percent by volume, urea-.01 to 5 percent by volume, carbomer-.01 to 5 percent by volume, curcumin-.0001 to 10 percent by volume and adding sufficient citric acid until the overall pH is within the range of 4.5 to 5.5.

20 A third basic embodiment of the present invention is directed to a medicine which uses a topical gel composition in combination with an orally administered daily dosage of Vitamin A in a dosage of between 150,000 (International Units) to 500,000 I.U.

## BRIEF DESCRIPTION OF THE DRAWING

For a better understanding of the present invention, reference is to be made to the accompanying drawings. It is to be understood that the present invention is not limited to the precise arrangement shown in the drawings.

Figure 1 is a diagrammatic longitudinal cross-sectional view through a typical hair follicle showing a normal, healthy hair follicle contained within skin;

Figure 2 is a view similar to Figure 1 but showing a plugged follicle due to accumulation of increased layers of stratum corneum cells;

Figure 3 is a substantially enlarged cross-section through human skin which has acne showing inflammatory cells in the skin; and

Figure 4 is a view similar to Figure 3 but showing the skin after treatment with the gel of the present invention.

## DETAILED DESCRIPTION OF THE INVENTION

Figures 1 and 2 depict in longitudinal cross-section a hair follicle 10 within which is mounted a hair bulb 12. The hair follicle 10 and the hair bulb 12 are mounted within the dermis 14. The hair bulb 12 develops a hair shaft 16 which then protrudes exteriorly of the skin surface 18. The horny layer 19 lining the

skin surface 18 as well as the hair follicle 10 is known as the stratum corneum 20. Surrounding the hair shaft 16 that is contained within the skin is a sebaceous gland 22. In Figure 1, the hair follicle 10 depicted is deemed to be normal forming a slight gap 24, which is exaggerated in size in the drawing of Figure 1, between the hair shaft 16 and the stratum corneum 20. The sebaceous gland 22 secretes sebum, which is an oil, which will normally pass through the slight gap 24 to be located on the skin surface 18. The problem arises, in conjunction with acne, in referring particularly to Figure 2 where the slight gap 24 closes which causes a creation of bacteria within the sebaceous gland 22 caused by clogging of the follicular opening by increased layers of stratum corneum cells 26. Bacteria is permitted to grow within the sebaceous gland 22 where there is no release for the sebum. This results in pustule formation. Generally, the pustule 26 will assume a reddened configuration giving a strong indication of the inflammation.

Referring particularly to Figures 3 and 4, there is shown greatly magnified sections of skin. In Figure 3, one can easily see the amount of inflammation that has occurred within the skin due to the acne which appears as darkened blotches. In Figure 4, the same skin that has been treated with the gel of the present invention is shown where it is readily observable that the amount of inflammation is substantially decreased. The inflammation is denoted not only as the darkened spots within Figures 3 and 4 but also as the substantial greyness in Figure 3

that is completely eliminated in Figure 4.

Plugging of the hair follicle 10 actually occurs by excessive layers of stratum corneum cells and is the underlying abnormality leading to the development of acne lesions. The sebum that is secreted by the sebaceous gland 22 fails to empty onto the skin surface due to the obstruction to the flow of sebum by the closing of the stratum corneum 20 about the hair shaft 16. This results in the accumulation of sebum and bacteria within the epidermis of the skin which includes the stratum corneum 20 and also within the dermis 14 of the skin. The acne formed pustule is then created.

The stratum corneum 20 is formed by multiple layers of cells, usually between ten and twenty, of flattened skin cells. These skin cells are cemented together by a glue called desmoglein. It has been found by using the gel of the present invention that this desmoglein can be removed by activating an enzyme by using a topical gel that contains curcumin which is acidified to a pH of between 4.5 and 5.5. The protease enzyme that is created digests the desmoglein causing the stratum corneum to retract from tight contact around the hair shaft 16 resulting in producing again the slight gap 24 which will then permit the sebum from the sebaceous gland 22 to be conducted exteriorly of the epidermis and to be deposited on the skin surface 18.

The views shown in Figures 3 and 4 comprise enlarged blowups of a skin section. Figure 3 was taken with a patient that is initially coming for treatment because of acne. Figure 4 is

the same skin section taken from the same patient after treatment. Treatment, with the present invention, usually comprises of applying once or twice a day the gel of the present invention forming a thin smear on the surface of the skin and leaving that thin smear on overnight or all day eventually washing it off and then retreating it. This treatment is to occur for about a six month period of time.

The gel type composition of the present invention can be formed containing different quantities of different ingredients. However, all compositions will include an anti-inflammatory agent and also an agent that stimulates the activity of an enzyme which digests the cementing substance contained within the stratum corneum cells of the epidermis thereby unplugging the follicles. The anti-inflammatory agent is from the group consisting of curcumin, polyphenols and corticosteroids. The agent that stimulates the activity of the enzyme is from the group consisting of citric acid, ascorbic acid, azelaic acid, glycolic acid, acetic acid and hydroxy acids. The gel is formulated by combining a certain amount of water, alcohol, cellulose, urea and carbomer together and thoroughly mix same. Curcumin is then added and also is thoroughly mixed. The pH of this substance is then taken and recorded. Generally, the pH will be around 7. The second agent, which is one of the acids with generally citric acid being preferred, is then to be added until the overall pH of the gel is within the range of 4.5 to 5.5 with generally around 4.5 being preferred. A synergistic response in stimulating the enzyme to



unplug the follicle is achieved by combining high doses orally of Vitamin A administered daily in the dosage amount of 150,000 I.U. to 500,000 I.U. (preferably 300,000 I.U.).

5 A typical composition for the gel of the present invention would be: water-from 60 to 85 percent volume, alcohol-5 to 30 percent by volume, cellulose-0.5 to 10 percent by volume, urea-0.1 to 5 percent by volume and carbomer-0.5 to 5 percent by volume. The amount of curcumin is .0001 to ten percent by volume. The amount of citric acid is, of course, depends upon whatever is  
10 required to lower the pH to approximately the 4.5 level.

It is considered to be within the scope of this invention that possibly other acids could be used and even other anti-inflammatory agents than other than what is disclosed. However, the use of the curcumin and the citric acid both seem to  
15 be the most preferred type of basic ingredients used within the gel composition of this invention.

The discussion included in this patent is intended to serve as a basic description. The reader should be aware that the specific discussion may not explicitly describe all embodiments  
20 possible and alternatives are implicit. Also, this discussion may not fully explain the generic nature of the invention and may not explicitly show how each feature or element can actually be representative of a broader function or of a great variety of alternative or equivalent elements. Again, these are implicitly  
25 included in this disclosure. It should also be understood that a variety of changes may be made without departing from the essence

of the invention. Such changes are also implicitly included in the description. These changes still fall within the scope of this invention.